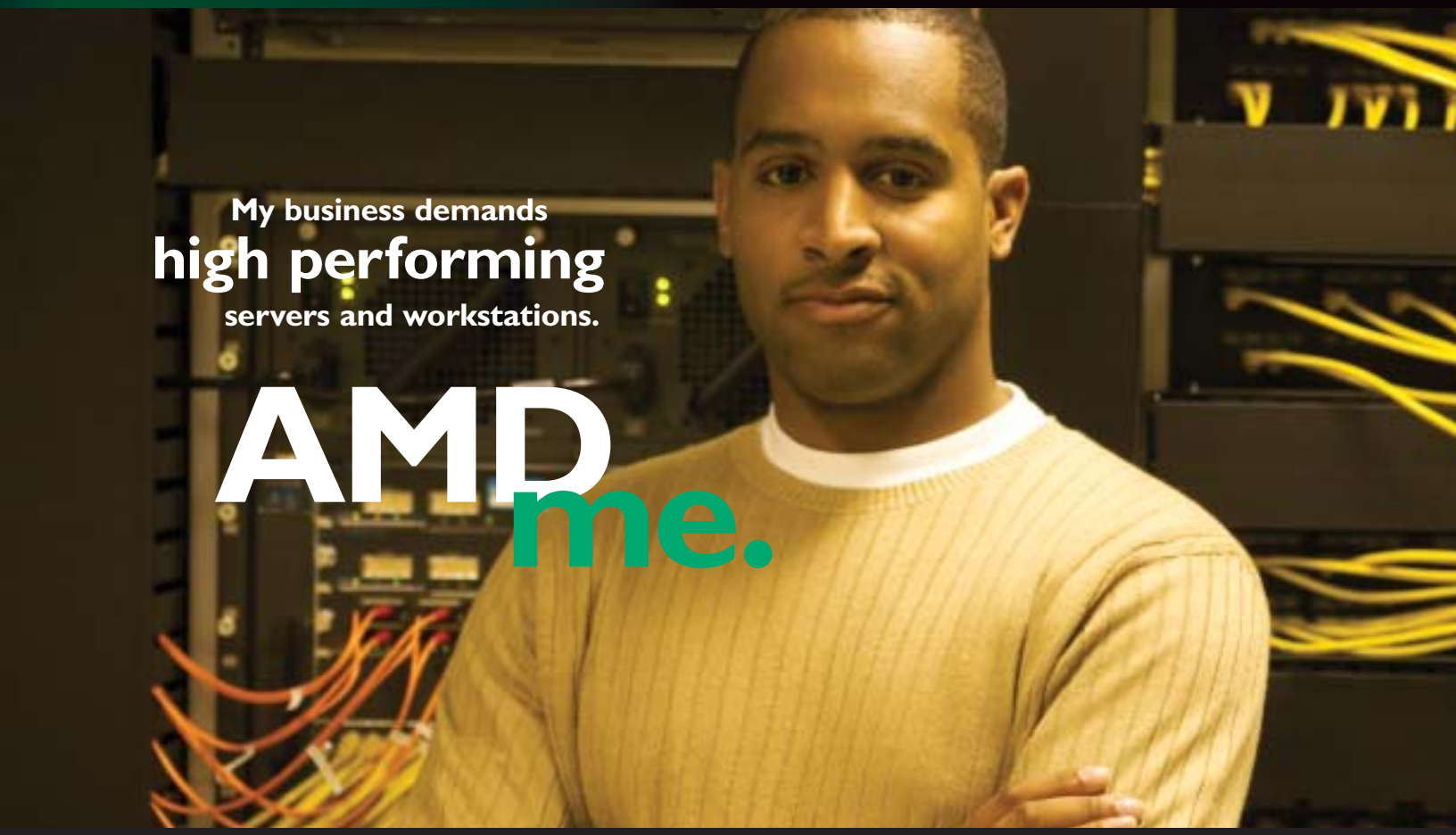


AMD Opteron™ processors:
The world's highest performing x86 enterprise-class solutions

When it comes to server/workstation solutions, AMD is re-invigorating the marketplace. In recent benchmarks, the AMD Opteron™ processor secured its market leadership position with unparalleled 32- and 64-bit performance for 2P and 4P servers. Now, this landmark processor family is set to do the same in the workstation space.

Built on AMD64 technology, the AMD Opteron processor is packed with performance-enhancing features, such as HyperTransport™ technology and the integrated memory controller. By putting them to work in your IT environment, you can minimize integration complexity and greatly simplify your day-to-day business.

The AMD Opteron processor is the only x86 server/workstation solution that enables you to run both 32- and 64-bit applications at the same time. With AMD64 technology, you can choose how you want to run your business and grow into 64-bit computing at your own pace – without sacrificing your investment in current hardware, software, and people. And thanks to complete backward compatibility, there's no need to recompile or make other changes to your existing 32-bit software. The industry's highest x86 server performance is already built in.

To find out more about the AMD Opteron processor, visit www.amd.com/opteron.

Processor features

AMD64 technology is an AMD innovation that delivers simultaneous 32- and 64-bit computing with next-generation application performance.

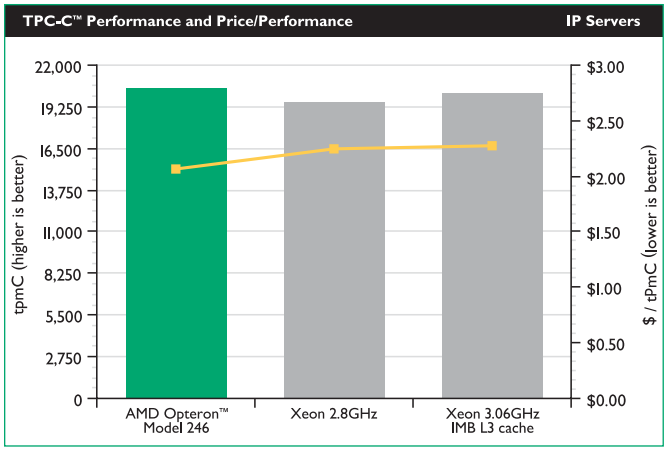
Up to 6.4GB/s per link, **HyperTransport™ technology** provides a high-speed connection between processors and core logic, with sufficient bandwidth to support new and existing interconnects.

The **128-bit wide, on-chip memory controller** provides low-latency memory bandwidth that scales as processors are added.

The AMD Opteron™ processor delivers outstanding performance for a wide range of server and workstation deployments.

As the benchmarks on these pages demonstrate, the AMD Opteron processor offers tremendous performance, flexibility, and scalability for today's demanding enterprise-class applications — including database server, Web server, Java application server, CAD/CAM, and digital content-creation applications.

TPC-C™ (IP): Database server performance and price-performance

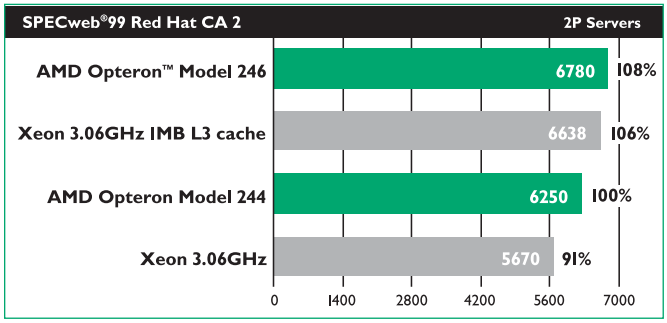


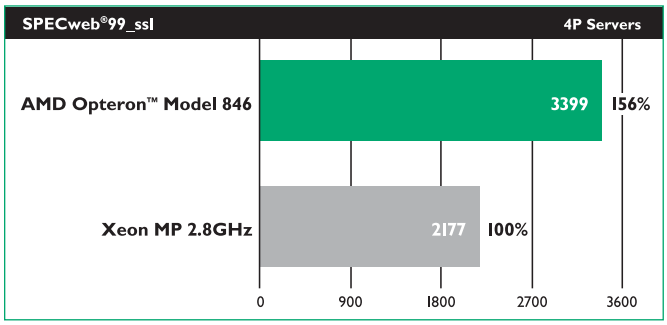
This benchmark measures a server's ability to function as an online transaction processing (OLTP) database server. It simulates a complete computing environment where various users execute order-entry transactions against a database – including placing a new order, making or receiving a payment, checking order status, monitoring delivery, and tracking stock levels.

The result is a measure of the number of new order transactions generated per minute while the system is also executing the other four transaction types.

These TPC-C scores are current as of September 8, 2003. For the most up-to-date TPC-C scores, go to www.tpc.org. TPC-C, tpmC and $/tpmC are trademarks of Transaction Processing Performance Council.

SPECweb®99 (2P) and SPECweb®99_SSL (4P): Web server performance





Both of these benchmarks simulate real-world Web server workloads in which a number of client systems make static and dynamic page requests. However, in SPECweb®99_SSL, those requests are made using HTTP over the Secure Sockets Layer Protocol (HTTPS).

The returned score shows the maximum number of simultaneous connections (conforming to specified maximum bit rates and segment size) that a Web server is able to support while still meeting specific throughput and error rate requirements.

This is intended to realistically model conditions that will be seen on the Internet during the lifetime of this benchmark.

SPEC and the benchmark name SPECweb are registered trademarks of the Standard Performance Evaluation Corporation. Competitive results stated above reflect results published on www.spec.org as of September 16, 2003. For the latest SPECint results visit http://www.spec.org/web99.

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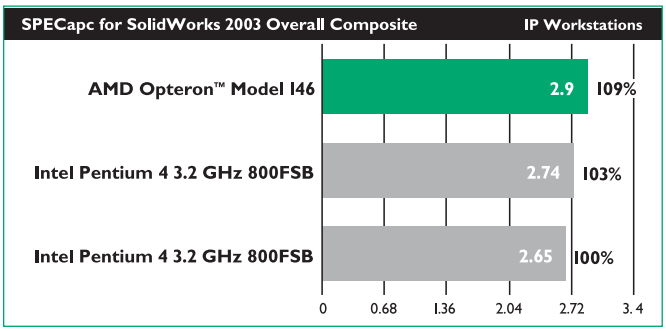
SPECapc℠ for SolidWorks 2003: CAD/CAM performance



This benchmark was developed specifically by SolidWorks to represent a day in the life of a typical SolidWorks 2003 user. It includes eight tests – I/O-intensive operations, CPU-intensive operations, and six different graphics tests – using different-sized CAD/CAM solid models as large as 3.13 million vertices.

The overall score is derived from a weighted geometric mean of the normalized score for all eight tests. The higher the score, the better.

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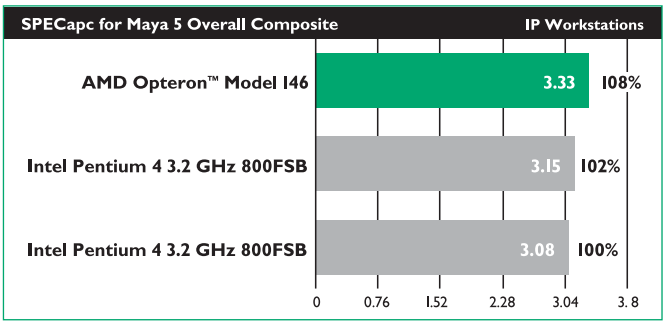
SPECapc for Maya 5: 3D content-creation performance

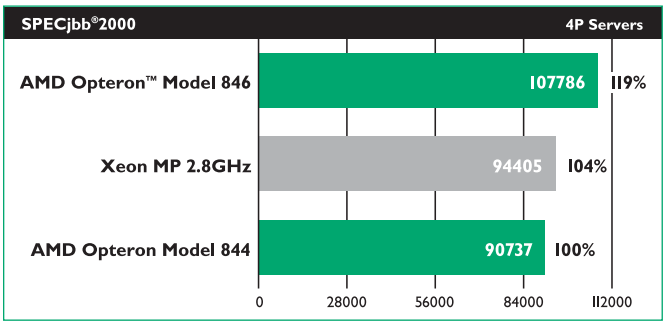


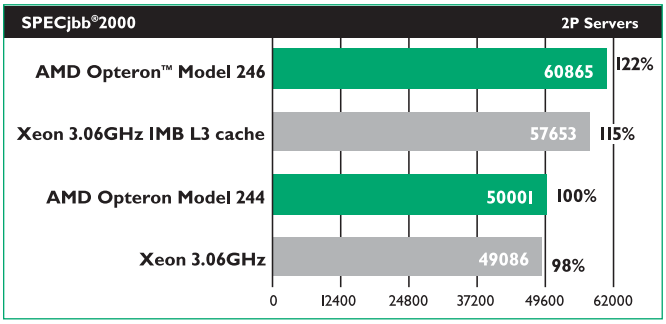
Developed cooperatively by Alias and SPECapc, this benchmark measures performance for IP workstations running Maya 5. Four different models are rendered and displayed in the five Maya 5 modes, and the benchmark offers a unique opportunity to test performance for large texture sizes and multiple viewports.

The overall composite score reflects 30 individual tests – 27 of which are run three times. Final scoring is based 70% on graphics (scene drawing and playback performance), 20% on CPU performance, and 10% on I/O performance.

SPEC and the benchmark name SPECapc are registered trademarks of the Standard Performance Evaluation Corporation. Competitive results stated above reflect results published on www.spec.org as of September 1, 2003. SPEC scores for AMD Opteron processor based systems are under submission to the SPEC organization as of August 29, 2003. For the latest SPECapc Maya 5 results visit http://www.spec.org/gpc/apc.data/specapc_maya50_summary.html.

SPECjbb®2000: Java application server performance





Three-tier systems are commonly used in ERP, CRM, e-business, and other tiered applications in which a Web browser is used to access database information. The system consists of a client and a database, with a Java application server in the middle – managing requests from the client, retrieving the appropriate information from the database, and returning that information to the client.

Simulating a wholesale company with warehouses serving several districts, this benchmark indicates the speed at which certain business operations are performed each second in either a 2P or 4P server.

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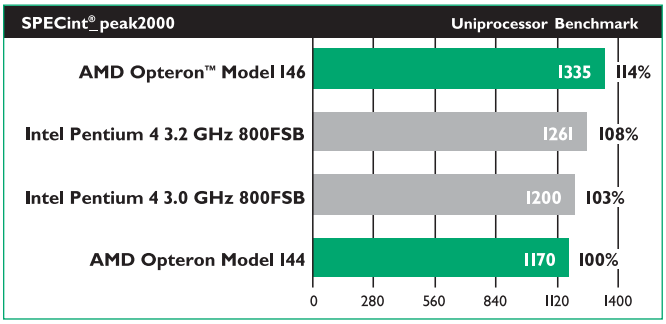
SPECint®_peak2000 and SPECint®_rate2000: Integer performance



SPECint_peak2000 highlights CPU, memory architecture, and compiler performance for compute-intensive integer applications. It comprises 12 integer benchmarks derived from software commonly used within IT departments and enterprise server deployments – including databases, e-mail servers, Java application servers, and Web servers. Such applications typically perform better when running on a processor with excellent integer performance.

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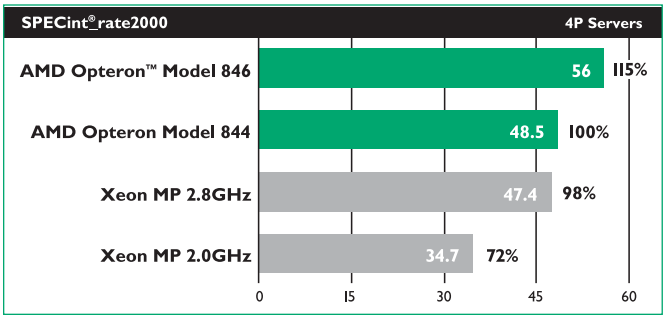

SPECint_rate2000 runs the same algorithms as SPECint_peak2000, but it executes multiple instances of the benchmark simultaneously to measure a multiprocessing system's ability to scale well and carry out multiple compute-intensive integer operations at once.

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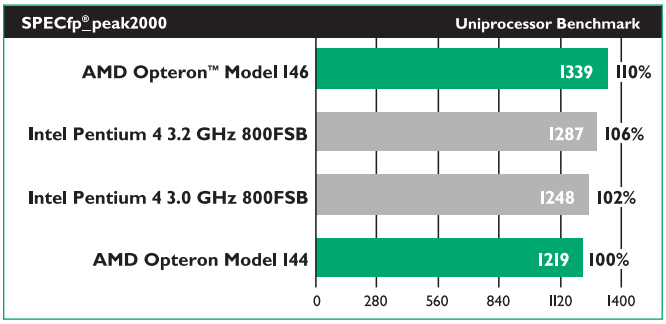
SPECfp®_peak2000 and SPECfp®_rate2000: Floating-point performance



SPECfp_peak2000 measures CPU, memory architecture, and compiler performance using 14 floating-point benchmarks developed from actual applications common to engineering and research environments. Such applications include computational fluid dynamics, CAD/CAM, digital content creation (DCC), rendering, and financial modeling tools – all of which typically perform better when running on a processor with excellent floating-point performance.

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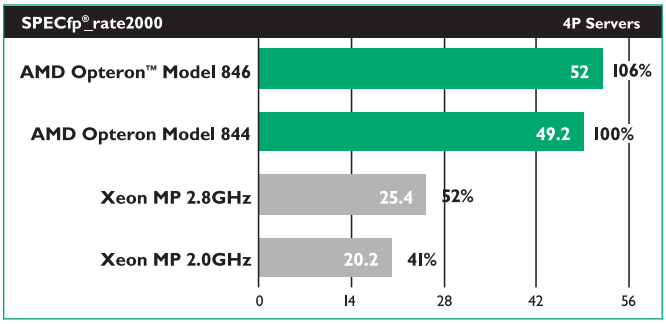

SPECfp_rate2000 runs identical algorithms as SPECfp2000, but it executes multiple instances of the benchmark at one time. This measures a system's ability to scale well and carry out multiple compute-intensive floating-point-based applications simultaneously.

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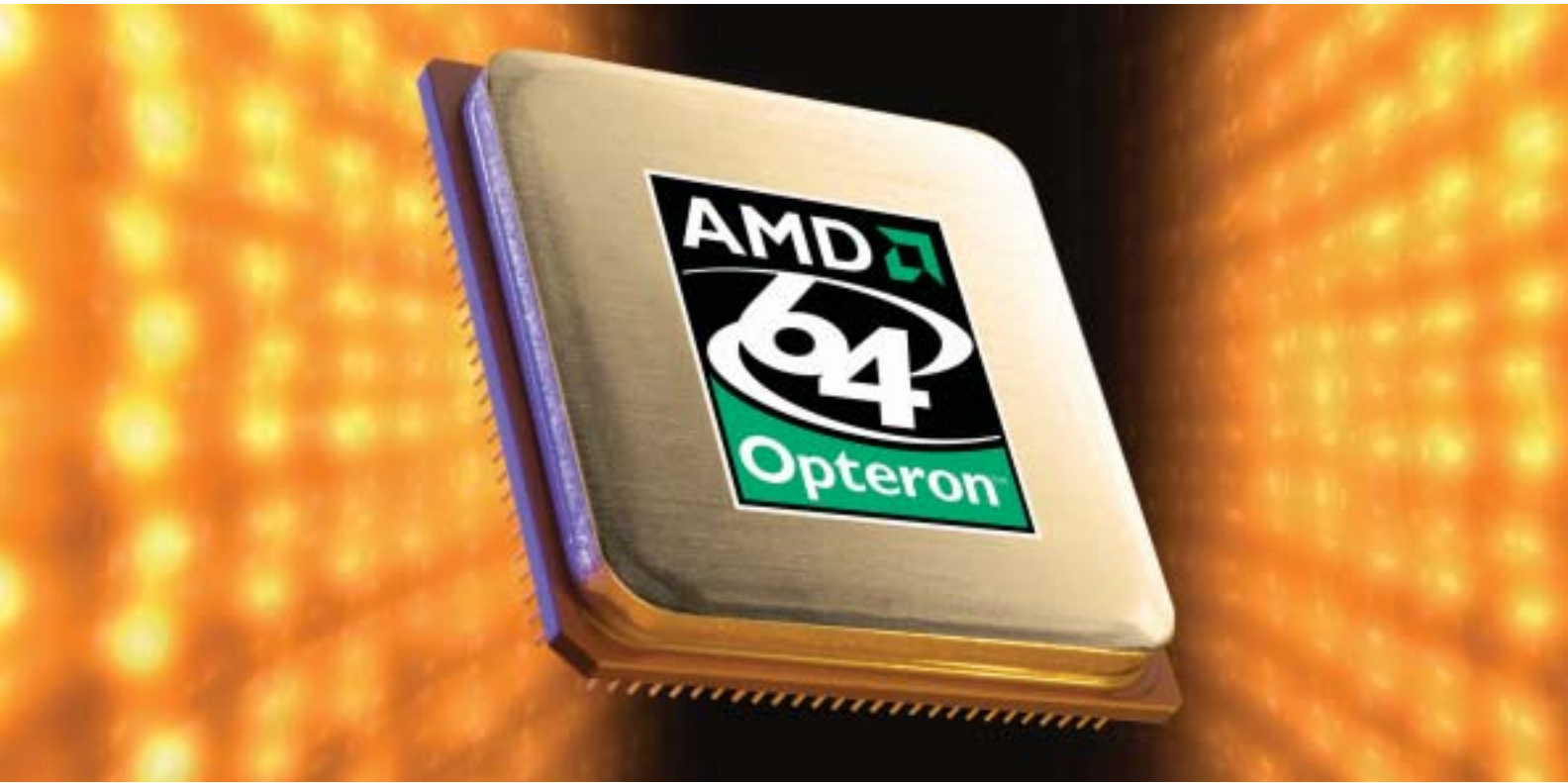

Get started today.

For more than 30 years – and with more than 200 million x86 processors shipped – AMD has forged a lasting commitment to providing innovative solutions that best fit your needs. Of course, that includes satisfying your business requirements as well as your customers' demands for compatibility, reliability, and performance. The AMD Opteron processor is the latest enterprise-class solution to develop from our customer-centric point of view, and we believe it has the technical muscle and innovations to help build your business now, and well into the future.

To find out more about the AMD Opteron processor, please visit us on the Web at www.amd.com/opteron.

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Founded in 1969 and based in Sunnyvale, California, AMD (NYSE: AMD) is a global supplier of integrated circuits for the personal and networked computer and communications markets with manufacturing facilities in the United States, Europe, Japan, and Asia. AMD, a Standard & Poor's 500 company, produces microprocessors, Flash memory devices, and silicon-based solutions for communications and networking applications.

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